

# **California Energy Commission**

## **STAFF REPORT**



### **LOCALIZED HEALTH IMPACTS REPORT**

For Selected Projects Awarded Funding Through the  
Alternative and Renewable Fuel and Vehicle Technology  
Program Under Solicitation PON-09-608

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# CALIFORNIA ENERGY COMMISSION

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## **PREFACE**

The increased use of alternative and renewable fuels supports the state's commitment to curb greenhouse gas emissions, reduce petroleum use, improve air quality, and stimulate the sustainable production and use of biofuels within California. Alternative and renewable transportation fuels include electricity, natural gas, biomethane, propane, hydrogen, ethanol, renewable diesel, and biodiesel. State investment is needed to fill the gap and fund the differential cost of these emerging fuels and vehicle technologies.

Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007) created the Alternative and Renewable Fuel and Vehicle Technology Program. This statute, amended by Assembly Bill 109 (Núñez, Chapter 313, Statutes of 2008) authorizes the California Energy Commission to "develop and deploy innovative technologies that transform California's fuel and vehicle types to help attain the state's climate change policies." The Energy Commission has an annual program budget of approximately \$100 million.

The statute also directs the California Air Resources Board to develop guidelines to ensure the programs complement efforts to improve air quality. The Air Quality Guidelines were approved in 2008. California Code of Regulations, Title 13, Chapter 8.1, Section 2343(c)(6) contains the requirement for the Energy Commission, being the funding agency, to analyze the localized health impacts of projects funded by the program that require a permit.

## ABSTRACT

California Code of Regulations, Title 13, Chapter 8.1, Section 2343(c)(6), requires the Energy Commission to consider the localized health impacts and environmental justice when selecting projects for funding. For each funding cycle, the Energy Commission is required to analyze localized health impacts for projects proposed for program funding that require a permit.

This report is a review of the projects submitted under the Hydrogen Fuel Infrastructure grant solicitation (PON-09-608) and proposed for funding under the Alternative and Renewable Fuel and Vehicle Technology Program for Fiscal Year 2010/2011. The report includes a description of the projects, criteria emissions data for the fuels associated with the projects and demographic data for the areas where the projects will be located, and an analysis of the impacts of these projects in communities with the most significant exposure to air contaminants or localized air contaminants. Future editions of this report and its aggregate location analysis will include information about projects approved in previous funding cycles, including those projects for which specific location information was not previously available.

**Keywords:** California Energy Commission, AB 118, localized health impacts, environmental justice, biofuel production, funding cycle, emissions, criteria emissions, air quality, greenhouse gas emissions, reduce petroleum use, improve air quality, alternative fuel, electricity, natural gas, biomethane, propane, hydrogen, ethanol, renewable diesel, biodiesel fuels

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## EXECUTIVE SUMMARY

The California Energy Commission is required to assess the local health impacts of a subset of projects proposed for funding under the Alternative and Renewable Fuels and Vehicle Technology Program. This report focuses on the potential impacts hydrogen fueling stations may have on a community, particularly those communities that are considered especially vulnerable to emissions increases within their community.

Environmental justice communities, low-income and minority communities are considered to be the most impacted by any project that could result in increased criteria and toxic air pollutants within an area because these communities typically have the most significant exposure to these emissions. Assessing these projects and the communities surrounding them is important because of the health risks associated with these pollutants. Preventing health issues from air pollution in any community is important, but it is especially important to minimize any negative impacts in communities that are already considered to be at risk due to their continued exposure to these contaminants. Three projects, with a total of 11 stations, are proposed for funding under the ARFVTP Hydrogen Fuel Infrastructure solicitation PON-09-608.

The following report analyzes the project station locations and provides demographic information on each community where a station will be located. Background is provided on methods used to determine the most highly impacted communities, as well as the methods being used where impacts may exist.

Three projects were funded under this solicitation; however, the projects were assessed on a station-by-station basis because the communities that the stations will be located in vary in terms of socioeconomic and environmental health. Of the 11 stations, two were fully assessed for health impacts. The remaining stations are not fully assessed in this report because they are not expected to have negative impacts on the air quality in the surrounding community or they are not located in a community that is considered to be highly impacted by air pollution.

Projects are assessed by individual stations in this report, as the stations are located throughout California in different communities with varying demographics. In general, no additional criteria emissions are associated with the stations, as hydrogen production, dispensing, and use in fuel cell vehicles do not emit any criteria or toxic tailpipe emissions. There are also no criteria emissions caused by the fueling stations themselves. Compressions, dispensing, cooling, and other on-site activities use only relatively small amounts of electric power for their operation.

Based on this analysis, it is not anticipated that the implementation of any projects funded will have negative impacts on surrounding communities because there will not be a net increase in criteria and toxic emissions, specifically those communities that are considered most vulnerable. Additionally, information is provided on the benefits of each project, as many projects are expected to provide economic benefits to communities, as well as improved quality of life in some instances, and even potential air quality improvements in the near future.



# CHAPTER 1:

## Background

The California Energy Commission is preparing to fund a series of alternative fuel projects through the Alternative and Renewable Fuel and Vehicle Technology Program (Health and Safety Code Section 44272). The Energy Commission developed this report to comply with the Air Quality Guidelines.<sup>1</sup> The section applies to all projects that require a permit and reads:

(6) Localized health impacts must be considered when selecting projects for funding. The funding agency must consider environmental justice consistent with state law and complete the following:

(A) For each fiscal year, the funding agency must publish a staff report for review and comment by the public at least 30 calendar days prior to approval of projects. The report must analyze the aggregate locations of the funded projects, analyze the impacts in communities with the most significant exposure to air contaminants or localized air contaminants, or both, including, but not limited to, communities of minority populations or low-income populations, and identify agency outreach to community groups and other affected stakeholders.

(B) Projects must be selected and approved for funding in a publicly noticed meeting.

The Air Quality Guidelines section requiring this analysis was put in place to ensure that, by funding the projects, the Energy Commission is both analyzing the potential beneficial impacts to communities with the most significant exposure to air contaminants and not supporting projects that result in disproportionate health impacts in communities with low-income or minority populations.

Based on the Energy Commission interpretation of the Air Quality Guidelines, this report provides information on the communities surrounding the project sites and assesses potential impacts to those communities as a result of the project. This report is not intended to be a detailed impact analysis of projects funded by the program, nor a replacement for the California Environmental Quality Act (CEQA), which will provide a detailed environmental impact assessment.

For the current program funding cycle (Fiscal Year [FY] 2010/11), 26 projects have been proposed for Energy Commission approval. This report discusses three new projects that will result in 11 hydrogen stations if funded.

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<sup>1</sup> Regulation for the AB 118 Air Quality Guidelines for the Air Quality Improvement Program and the Alternative and Renewable Fuel and Vehicle Technology Program, California Code of Regulations, Title 13, Chapter 8.1, Section 2343(c)(6), 2008.

Table 1 provides a summary of the projects by solicitation (Program Opportunity Notice).

**Table 1: Count of Awards by Solicitation for FY 2010/2011**

Project Type	Program Opportunity Notice	Number of Projects
Biofuel Production	PON-09-604	12
Manufacturing	PON-09-605	11
Hydrogen Infrastructure	PON-09-608	3

Source: Energy Commission Staff Analysis

Thus far in the FY 2010-11, proposed awards were announced for two solicitations. The Biofuel Production Plants solicitation (PON-09-604) provided funding and financial assistance for the development of new, California-based biofuel production facilities and enhanced the operation of existing ethanol production facilities to increase statewide biofuel production and reduce greenhouse gas emissions. The Manufacturing Plants: Electric Vehicles, Alternative Fuel Vehicles, Vehicle Components and Batteries solicitation (PON-09-605) provided financial assistance for the development and expansion of manufacturing and assembly plants in California that produce electric vehicles, batteries, and component parts for alternative fuel vehicles.

The following is a discussion of the potential for localized health impacts from the projects being proposed for Energy Commission approval under the Hydrogen Fuel Infrastructure solicitation (PON-09-608). This solicitation provides funding to projects that develop the infrastructure necessary to dispense hydrogen transportation fuel to support the deployment of hydrogen fuel cell vehicles in California. Three projects are proposed for funding under this solicitation, resulting in 11 station locations. The assessment will provide overviews of potential health impacts on a station-by-station basis. Energy Commission staff plans to present the proposed projects for approval at business meetings (subject to the Warren-Alquist Open Meeting Act), upon receipt of the appropriate CEQA documentation, in the first quarter of 2011.

## **Assessment Approach and Definitions**

Staff reviewed results from the Environmental Justice Screening Method (EJSM)<sup>2</sup> to identify projects that are located in areas with social vulnerability indicators and the greatest exposure to air pollution and associated health risks. The EJSM was developed in order to identify low-income communities that are highly impacted by air pollution for purposes of assessing the impacts of climate change regulations, specifically Assembly Bill 32 (Núñez, Chapter 488, Statutes of 2006).

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<sup>2</sup> *Air Pollution and Environmental Justice, Integrating Indicators of Cumulative Impact and Socio-Economic Vulnerability into Regulatory Decision-Making*. 2010. Manuel Pastor Jr., Ph.D., Rachel Morello-Frosch, Ph.D., James Sadd, Ph.D.

The EJSM identifies the various levels of risk in regions throughout California, and high-risk communities are considered especially vulnerable to even the smallest impacts. The EJSM integrates data on exposure to air pollution, cancer risk, ozone concentration and frequency of high ozone days, race/ethnicity, poverty level, homeownership, median household value, educational attainment, and sensitive populations (populations under 5 years of age, or over 65 years of age). These results are available for Southern California. The Air Resources Board applied the method<sup>3</sup> to the Bay Area, San Joaquin Valley, and Desert regions; however, the results consider only income among the list of social vulnerability indicators. For communities not yet assessed in the EJSM, the Energy Commission identified high-risk areas as those in non-attainment air basins for ozone, particulate matter (2.5), and particulate matter 10, who have high poverty and minority rates, as well as a high percentage of sensitive populations.

The report provides a brief overview of all projects proposed for awards under the solicitation for informational and transparency purposes. However, staff did not assess impacts for projects that are not located in one of the areas identified by the EJSM. Projects with detailed assessments represent the projects that are located in a low-income community that is highly impacted by air pollution. Populations within these communities are presumed to be most susceptible to health risks due to their exposure to criteria and toxic air pollutants on a more continual basis than other regions.

For this assessment, the Energy Commission interprets “permits” to mean discretionary and conditional use permits because they require a review of potential impacts to a community and the environment before the permit is issued. Ministerial level permits, such as building permits, do not assess public health-related pollutants. Energy Commission staff does not assess projects requiring only ministerial level permits in this report. For air permits,<sup>4</sup> local air districts conduct a new source review<sup>5</sup> to determine emission impacts of the production facility. Incremental increases in criteria emissions must be reduced or mitigated through Best Available Control Technologies (BACT) and, possibly, Emission Reduction Credits (ERC). A new source review is an analysis conducted by local air pollution control districts to determine if a modification to an existing facility or construction of a new facility will result in significant increased air emissions within the given region. Immediate action must be taken by the appropriate party for any toxics released that exceed predetermined thresholds before a facility is reconsidered for a permit. An overview of the permit requirements for identified projects in at-risk communities is included in the project overviews.

Demographic data for the known or planned project locations is provided in Table 4. Energy Commission staff collected data on ethnicity, age, and income for the city where the project will

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3 *Proposed Screening Method for Low-Income Communities Highly Impacted by Air Pollution for AB 32 Assessments*, 2010.

4 Health and Safety Code Section 40918-40920.5.

5 Health and Safety Code Section 42300.

be located to identify communities with higher minority populations, lower incomes, and higher sensitive groups based on age. For this discussion, program staff identified sensitive populations as fewer than 5 years of age and over 65 years of age. This assessment is not intended as a substitute for the comprehensive environmental review conducted by regulatory agencies during the CEQA process. The application of CEQA will provide a more detailed analysis at the potential for adverse environmental effects of the proposed projects. Instead, this report is intended to collect available information about the potential air quality impacts of the projects that the Energy Commission is funding through the Alternative and Renewable Fuel and Vehicle Technology Program and provide an aggregate, narrative analysis of localized health impacts of those projects.

The Air Quality Guidelines mandate the Energy Commission to track each project's progress through the CEQA process and ensure there is a commitment in place from the project proponent to complete all mitigation measures required by the permitting agency prior to a project receiving the first funding allocation.

## **Project Overviews**

The following is an overview, presented by fuel type, of the projects proposed for award. The overviews include a project description and information on the existing site. Where applicable, the overviews also include a discussion on the potential health impacts related to air pollutants, and any outreach efforts to be completed by the Energy Commission, grantee, or permitting agency. These outreach efforts include information on and requirements related to air district permitting, and information about efforts conducted by the recipient, which can include the posting of public notices, community outreach through public meetings, or newspaper articles.

The projects included in this report are:

1. Air Products and Chemicals, Inc.'s, "Low Cost Hydrogen Refueling Station Deployment Program"
  - a. Central Fill Station
  - b. UC Irvine Station (upgrade of existing station)
  - c. Santa Monica Station
  - d. Beverly Hills Station
  - e. West Los Angeles Station
  - f. Hermosa Beach Station
  - g. Irvine North Station
  - h. Diamond Bar Station (upgrade of existing station)
  - i. Hawthorne Station
2. Linde's, LLC, "Linde West Sacramento and Laguna Niguel Hydrogen Fueling Stations"
  - a. West Sacramento Station
  - b. Laguna Niguel Station

3. Airport Commission, City and County of San Francisco's, " SFO West Bay Hydrogen Fueling Station"

The table below summarizes the findings of the project assessment. For high-risk communities, more detail is provided on the project in the appropriate chapter.

**Table 2: Community Status and Project Overview**

<b>Project</b>	<b>At Risk Community</b>	<b>CEQA Completed</b>	<b>Air District Permit Status</b>	<b>Attainment Status for Ozone, PM (2.5), PM(10)</b>
<b>Air Products and Chemicals</b>				
Central Fill Station		In Progress	In Progress	Non-Attainment (All)
UC Irvine Station		In Progress	In Progress	Non-Attainment (All)
Santa Monica Station		In Progress	In Progress	Non-Attainment (All)
Beverly Hills Station		In Progress	In Progress	Non-Attainment (All)
West Los Angeles Station		In Progress	In Progress	Non-Attainment (All)
Hermosa Beach Station		In Progress	In Progress	Non-Attainment (All)
Irvine Station		In Progress	In Progress	Non-Attainment (All)
Diamond Bar Station		In Progress	In Progress	Non-Attainment (All)
Hawthorne Station	X <sup>6</sup>	In Progress	In Progress	Non-Attainment (All)
<b>Linde, LLC</b>				
West Sacramento Station	X	X	In Progress	Non-Attainment (All)
Laguna Niguel Stations		X	In Progress	Non-Attainment (All)
<b>Airport Commission, City and County of San Francisco</b>				
SFO West Bay Hydrogen		Exempt		Non-Attainment (All)

Source: Energy Commission Staff Analysis

<sup>6</sup> Fully assessed due to close proximity high-risk communities.

## **CHAPTER 2:**

### **Air Products and Chemicals, Inc.**

#### **Project Name:**

Air Products and Chemicals, Inc.'s, "Low Cost Hydrogen Refueling Station Deployment Program."

#### **Project Description**

Air Products and Chemicals, Inc., (Air Products) will use this grant to construct six new hydrogen fueling stations and upgrade two existing stations at various locations throughout the greater Los Angeles area. At full demand, the stations will each be able to provide approximately 180 kilograms per day (enough to fuel approximately 180 vehicles per day). This project will also provide the deployment of new, proprietary hydrogen delivery trailers and the construction of a central hydrogen filling system to fill these trailers. The trailers will be located at each of the eight stations and replaced with a full trailer, once the hydrogen fuel is depleted. The fuel will be dispensed into the vehicles via electrically run compressors and dispensers.

According to the California Air Resources Board and the U.S. Department of Energy, hydrogen vehicles are considered zero emission vehicles and hence are not considered concerns for local air pollution.<sup>7</sup> Small amounts of indirect carbon dioxide and direct water emissions may occur through onsite compression, storage, and dispensing of the hydrogen. Hydrogen can escape in small amounts through the vents required for the dispensing equipment. However, when the hydrogen comes in contact with oxygen, water is formed, and no additional emissions are generated. The fuel being transported to this station will be transported via trucks pulling the hydrogen trailers, resulting in no net increase in criteria and toxic air contaminants over existing fuel delivery trucks.

#### **Potential Impacts and Benefits**

The central filling stations and eight fueling stations will not result in adverse health impacts to sensitive populations at the project sites or in the cities where the stations will be located. The central filling system is located 3,000 feet from the closest neighborhood and is surrounded by industrial areas. It is a pre-existing large-scale hydrogen steam methane reforming plant that produces hundreds of thousands kilograms of hydrogen per day for industrial users, such as nearby refineries. Only a small fraction of the hydrogen gas goes to use as transportation fuel. The new central filling system will be used for compression, filling of trailers, and some purification activity, none of which result in direct criteria emissions. The equipment is powered by electricity.

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<sup>7</sup> Alternative Fuel Data Center: Hydrogen Emissions. U.S. Department of Energy  
[http://www.afdc.energy.gov/afdc/vehicles/emissions\\_hydrogen.html](http://www.afdc.energy.gov/afdc/vehicles/emissions_hydrogen.html),  
California Air Resources Board  
[http://www.arb.ca.gov/fuels/altfuels/electric\\_hydrogen/electric\\_hydrogen.htm](http://www.arb.ca.gov/fuels/altfuels/electric_hydrogen/electric_hydrogen.htm)



The stations only include compression, storage, and dispensing devices that have no direct criteria emissions and will use electricity for operation.

## **Outreach Efforts**

All of the stations to be constructed through this project are located in the South Coast Air Quality Management District. The air district will evaluate the station emissions during the permitting evaluation process and will adhere to federal and state regulations to notice residents within 1,000 feet of the site if the project will result in an increase in emissions above the threshold. The South Coast Air Quality Management district will also post notices to the Air Resources Board and Environmental Protection Agency websites and in local newspapers if the project is using emission offsets or emission reduction credits.

### **Central Fill Station**

#### *Project Site*

The station will be located on S. Alameda Street, near East Sepulveda, in Carson, CA.

This portion of the project will be to upgrade capacity at the existing central fill station.

#### *Rationale for Exclusion From Localized Health Impacts Assessment*

This central fill station is not located in a low-income community that is highly impacted by air pollution, and the station will not produce any new criteria emissions. Therefore, the project is excluded from the assessment of localized health impacts and the corresponding 30-day public review period.

### **Stations**

#### *1. UC Irvine Station*

##### *Project Site*

The station will be located at the UC Irvine Campus at 19172 Jamboree Boulevard, Irvine, CA, 92612. This portion of the project will be to upgrade an existing hydrogen fueling station on the UC Irvine Campus.

##### *Rationale for Exclusion From Localized Health Impacts Assessment*

This station is not located in a low-income community that is highly impacted by air pollution, and the station will not produce any new criteria emissions. Therefore, the project is excluded from the assessment of localized health impacts and the corresponding 30-day public review period.

#### *2. Santa Monica Station*

##### *Project Site*

This station will be located at 1402 Santa Monica Boulevard, Santa Monica, CA, 90404. This new hydrogen fueling equipment will be installed at an existing retail gasoline station.

### *Rationale for Exclusion From Localized Health Impacts Assessment*

This station is not located in a low-income community that is highly impacted by air pollution and the station will not produce any new criteria emissions. Therefore, the project is excluded from the assessment of localized health impacts and the corresponding 30-day public review period.

### *3. Beverly Hills Station*

#### *Project Site*

This station will be located at 1004 S. La Cienega Boulevard, Los Angeles, CA, 90035. The new hydrogen fueling equipment will be installed at an existing gasoline retail fueling station.

#### *Rationale for Exclusion From Localized Health Impacts Report*

This station is not located in a low-income community that is highly impacted by air pollution and the station will not produce any new criteria emissions. Therefore, the project is excluded from the assessment of localized health impacts and the corresponding 30-day public review period.

#### *4. West Los Angeles Station*

##### *Project Site*

This station is located at 11261 Santa Monica Boulevard, Los Angeles, CA, 90025. The new hydrogen fueling equipment will be installed at an existing gasoline retail fueling station.

#### *Rationale for Exclusion From Localized Health Impacts Report*

This station is not located in a low-income community that is highly impacted by air pollution and the station will not produce any new criteria emissions. Therefore, the project is excluded from the assessment of localized health impacts and the corresponding 30-day public review period.

#### *5. Hermosa Beach*

##### *Project Site*

This station is located 1131 Pacific Coast Highway, Hermosa Beach, CA, 90254. The new hydrogen fueling station will be constructed at an existing gasoline retail fueling station.

#### *Rationale for Exclusion From Localized Health Impacts Report*

This station is not located in a low-income community that is highly impacted by air pollution and the station will not produce any new criteria emissions. Therefore, the project is excluded from the assessment of localized health impacts and the corresponding 30-day public review period.

#### *6. Irvine North Station*

##### *Project Site*

This station is located at 4162 Trabuco Road, Irvine, CA, 92620. The new hydrogen fueling equipment will be installed at an existing gasoline retail fueling station.

#### *Rationale for Exclusion From Localized Health Impacts Report*

This station is not located in a low-income community that is highly impacted by air pollution and the station will not produce any new criteria emissions. Therefore, the project is excluded from the assessment of localized health impacts and the corresponding 30-day public review period.

## *7. Diamond Bar Station*

### *Project Site*

This station is located at 21865 E. Copley Drive, Diamond Bar, CA, 91765. The existing hydrogen fueling station at the South Coast Air Quality Management District's headquarters will be upgraded under this project.

### *Rationale for Exclusion From Localized Health Impacts Report*

This station is not located in a low-income community that is highly impacted by air pollution and the station will not produce any new criteria emissions. Therefore, the project is excluded from the assessment of localized health impacts and the corresponding 30-day public review period.

## *8. Hawthorne Station*

### *Project Site*

This station is located at 5230 Rosecrans Avenue, Hawthorne, CA, 90250. The new hydrogen fueling equipment will be installed at an existing gasoline retail fueling station.

While the project address is in Hawthorne, staff considered the project's close proximity to Lennox, which is a low-income area highly impacted by air pollution, and assessed the impacts as a precaution. However, the stations will not produce and new criteria emissions.

The station will be located in the South Coast Air Basin, a non-attainment area for ozone, particulate matter (10 micron), and particulate matter (2.5 micron) pollutants. There are 9 schools, 1 daycare, and 2 health care facilities within a one-mile radius of the project site.

### *Potential Impacts and Benefits*

According to the California Air Resources Board's "Screening Method for Low-Income Communities Highly Impacted by Air Pollution for AB32 Assessments," this station is not located in a low-income community that is highly impacted by air pollution. However, based on staff review, this station is located within close proximity to a community that is low-income and highly impacted by air pollution.

The station must adhere to federal safety standards. In addition to all applicable code requirements, the dispenser at this station has additional safety features such as a secondary control system, idle hose leak detection, and protective jackets over hoses. These safety features ensure that the station is safe for the community and station users.

This station is located right off of the Interstate 405 freeway, which means that the station is easily accessible to customers. Based on the information provided by Air Products and Original Equipment Manufacturer (OEM) projections for hydrogen use, it is expected that this station will be dispensing approximately 11-18 kilograms of hydrogen per day, which is equivalent to an additional 11-18 cars coming to the station location each day. No additional emissions are expected to result from the use of the hydrogen dispenser at this station.

Because the hydrogen will be produced near this station, and the community of Hawthorne, in Wilmington/Carson, additional job opportunities may be available for the community as a result of the installation of this dispenser. This station will result in the creation of several jobs including three filling terminal operators and 2-4 drivers to deliver the fuel to each station.

The South Coast Air Quality Management District has extensive experience in issuing permits for hydrogen fill stations and will ensure that Air Products and this station comply with all federal, state, and air district standards to ensure the safety and health of all surrounding communities.

It is not anticipated that this station will have an adverse effect on surrounding communities, as no criteria emissions or toxic air contaminants will be emitted from the installation of the hydrogen fueling equipment at this existing station.

## **CHAPTER 3:**

### **Linde, LLC**

#### **Project Name**

Linde LLC, “Linde West Sacramento and Laguna Niguel Hydrogen Fueling Stations”

#### **Project Description**

Linde will install two hydrogen fueling stations that will be located in West Sacramento and Laguna Niguel. Linde will design and build an MF90 Hydrogen Fueling system with a capacity of 20 kilograms per hour, one dual-faced, Society for Automotive Engineers (SAE) J2601 standard compliant dispenser with 700 and 350 bar (pressure measurement levels equivalent to 10,000 and 5,000 pound-force per square inch gauge (psig)) fueling capability, and high-pressure storage to increase peak fueling capacity for each station location. Linde will be partnering with Praxair, who will supply the liquid hydrogen tank and vaporization as a part of its match share. Linde will own and operate the fueling station and lease land from the station owner. The Laguna Niguel station is ideally located in an area that OEM’s plan to target for fuel cell vehicle deployment both now and in the coming years. Linde will be using biogas to increase its renewable portion of hydrogen produced.

#### **Potential Impacts and Benefits**

Linde does not foresee any possibility that this project could add criteria pollutants and toxic air contaminants to the localized air shed and affect ambient air quality levels because hydrogen production, dispensing, and use do not emit any criteria or toxic emissions to an extent that would adversely affect the local communities’ health. There is no onsite production and related emissions, and the stored hydrogen is environmentally benign. Linde’s compression system operates on specially designed and patented lubrication and cooling systems designed to operate in a safe and self-contained fashion, overseen regularly by Linde’s operations team.

Additionally, according to the California Air Resources Board and the U.S. Department of Energy, hydrogen vehicles are considered zero emission vehicles and hence are not considered concerns for local air pollution.<sup>8</sup> Small amounts of indirect carbon dioxide and direct water emissions may occur through onsite compression, storage, and dispensing of the hydrogen. Hydrogen can escape and be emitted through the vents required for the compressor. However, when the hydrogen comes in contact with oxygen, water is formed, and no additional emissions are generated.

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<sup>8</sup> Alternative Fuel Data Center: Hydrogen Emissions. U.S. Department of Energy  
[http://www.afdc.energy.gov/afdc/vehicles/emissions\\_hydrogen.html](http://www.afdc.energy.gov/afdc/vehicles/emissions_hydrogen.html),  
California Air Resources Board,  
[http://www.arb.ca.gov/fuels/altfuels/electric\\_hydrogen/electric\\_hydrogen.htm](http://www.arb.ca.gov/fuels/altfuels/electric_hydrogen/electric_hydrogen.htm)

Other than minimal construction emissions, no criteria emissions will result from the installation of these two stations. There are no criteria emissions emitted by the dispensing of hydrogen and no criteria or toxic emissions result from the use of hydrogen in vehicles.

## **Outreach Efforts**

The three stations are located in the South Coast Air Quality Management District, the Sacramento Metropolitan Air Quality Management District, and the Bay Area Air Quality Management District. The air districts will evaluate the stations during the permitting evaluation process and will adhere to federal and state regulations to notice residents within 1,000 feet of the site if the project will result in an increase in emissions above the threshold. The air districts will also post notices to the Air Resources Board and Environmental Protection Agency websites and in local newspapers if the project is using emission offsets or emission reduction credits.

## **Stations**

### *1. West Sacramento Station*

#### *Project Site*

This station will be located at a Shell station on 2816 West Capitol Avenue in West Sacramento, CA, 95691. The new hydrogen fueling equipment will be installed at an existing gasoline retail fueling station. The station will be located in the Sacramento Valley Air Basin, a non-attainment area for ozone, particulate matter (10 micron), and particulate matter (2.5 micron) pollutants. There are four schools, no daycares, and one health care facility within a one-mile radius of the project site.

#### *Project Impacts and Benefits*

According to the California Air Resources Board and the U.S. Department of Energy, hydrogen vehicles are considered zero emission vehicles and hence are not considered concerns for local air pollution.<sup>9</sup> Small amounts of indirect carbon dioxide and direct water emissions may occur through onsite compression, storage, and dispensing of the hydrogen. Hydrogen can escape and be emitted through the vents required for the dispensing equipment. However, when the hydrogen comes in contact with oxygen, water is formed, and no additional emissions are generated.

The project funds construction of a hydrogen fueling station at an existing gas station in West Sacramento. The hydrogen fueling station will consist of Linde's MF90 Fueling System with a dispenser, high-pressure storage container, and International Organization for Standardization (ISO) container, with a total project footprint of less than 800 square feet. The station is in close

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<sup>9</sup> Alternative Fuel Data Center: Hydrogen Emissions. US Department of Energy  
[http://www.afdc.energy.gov/afdc/vehicles/emissions\\_hydrogen.html](http://www.afdc.energy.gov/afdc/vehicles/emissions_hydrogen.html),  
California Air Resources Board,  
[http://www.arb.ca.gov/fuels/altfuels/electric\\_hydrogen/electric\\_hydrogen.htm](http://www.arb.ca.gov/fuels/altfuels/electric_hydrogen/electric_hydrogen.htm)

proximity to the California Fuel Cell Partnership (CaFCP), whose members will use this station regularly to fill hydrogen vehicles. It is anticipated that approximately two to seven vehicles will use the hydrogen station every hour, assuming that the station is open, for approximately 12 hours per day.

This station will be supplied with hydrogen produced by the steam methane reformation (SMR) process, which uses natural gas. Linde will be using renewable natural gas in the production of the hydrogen, which further reduces emissions and will exceed the Senate Bill 1505 (Lowenthal, Chapter 877, Statutes of 2006) requirement<sup>10</sup> by 10 percent.

Because the equipment is being installed at an existing gas station with little expansion of use, and the new structures are small and well under the 2,500 square foot limitation in the categorical exemption, the Energy Commission CEQA determination is that the project will not have a significant impact on the environment and is categorically exempt from further environmental review by the Energy Commission.

The station must adhere to federal safety standards and features many safety components built in to ensure that the station is safe for the community and station users. The Sacramento Metropolitan Air Quality Management District has experience in issuing permits for hydrogen fill stations, and will ensure that Air Products and this station comply with all federal, state, and air district standards to ensure the safety and health of all surrounding communities.

The station in West Sacramento is receiving strong support and match funding from the CaFCP. Furthermore, approximately 44 jobs will be created during the construction of this station, potentially contributing to the local workforce.

## *2. Laguna Niguel Station*

### *Station Location*

This station will be located at 30072 Crown Valley Parkway, Laguna Niguel, CA, 92677. The new hydrogen fueling equipment will be installed at an existing gasoline retail fueling station.

### *Rationale for Exclusion From Localized Health Impacts Report*

Laguna Niguel is not considered a low-income community highly impacted by air pollution and the station will not produce any new criteria emissions. Therefore, the project is excluded from the assessment of localized health impacts and the corresponding 30-day public review period.

## *3. SFO Station*

### *Project Site*

This station will be located at the south boundary of the San Francisco International Airport property adjacent to the Route 101 Freeway in Millbrae, CA, 94030.

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<sup>10</sup> Requires a portion of the renewable gas produced and used to be renewable.



*Rationale for Exclusion From Localized Health Impacts Report*

Millbrae is not considered a low-income community highly impacted by air pollution and the station will not produce any new criteria emissions. Therefore, the project is excluded from the assessment of localized health impacts and the corresponding 30-day public review period.

## **CHAPTER 4:**

### **Aggregate Location Analysis and Community Impacts**

An Air Resources Board fact sheet<sup>11</sup> describes the health impacts of exposure to air pollutants. In particular, ozone and particulate matter exposure is the cause of approximately 210,000 cases of asthma and 8,800 premature deaths each year.

The proposed hydrogen fuel infrastructure will increase the widespread use of alternative fuel vehicles in place of their petroleum counterparts. There are no criteria emissions or toxic air pollutants associated with dispensing and using hydrogen in a vehicle. As fuel cell vehicles enter the market and begin to displace gasoline and diesel vehicles, tailpipe pollutants will be eliminated. Small amounts of indirect carbon dioxide and direct water emissions may occur through onsite compression, storage, and dispensing of the hydrogen. Indirect CO<sub>2</sub> emissions come from the use of electricity for the onsite compressors. These compressors use electricity from the grid. The electricity generation occurs offsite; therefore, the associated emissions do not affect the communities in which the stations are located. However, at a fueling station like Diamond Bar where solar panels produce power, CO<sub>2</sub> emissions are not considered an indirect emission. While the solar panels are not hooked up to the station equipment, they produce an amount of power equivalent to the station's needs that is fed into the electrical grid.

Overall, the projects proposed for funding will result in net criteria pollutant reductions, including those identified as the cause of asthma and premature deaths. As described in the assessment above, one of the stations being considered for funding is in a community that is highly impacted by air pollution with low-income neighborhoods, but it is not anticipated that there will be any adverse health effects in high-risk communities as a result of the construction and use of these stations. Nor is the Hawthorne station, which is close to a low-income community highly impacted by air pollution, expected to result in any adverse health effects in the adjacent community as a result of the installation and use of the equipment.

A notable benefit from the projects is the improved air quality from the use of hydrogen vehicles, which do not emit any tailpipe criteria air pollutants, when compared to their gasoline and diesel equivalents. Local job creation is another anticipated benefit of these projects. Additionally, the fuel being transported to most of the stations in the Los Angeles area will be transported via hydrogen-run vehicles, resulting in no net increase in criteria and toxic air contaminants over existing fuel delivery trucks. The projects are anticipated to improve the environment and result in socioeconomic benefits by generating jobs and revenue for local communities that would otherwise not be available.

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<sup>11</sup> Health Effects of Particulate Matter and Ozone Air Pollution. November 2007.

Considered with the other projects funded in this funding cycle, no communities are disproportionately affected. The stations are mainly in Southern California, with only one station being built in San Francisco and one being built in Sacramento. Many of the stations are being built or upgraded in the Los Angeles area because hydrogen vehicle manufacturers are targeting this area for the first phase of vehicle deployments.

Table 3 summarizes cities where two or more environmental justice indicators<sup>12</sup> exist. Table 4 provides city-level data for the proposed projects to give additional insight on the community demographics where the projects will be located.

**Table 3: Cities With Environmental Justice Indicators**

City	Minority	Poverty Level	Unemployment Rate	Age
Carson	X		X	
Hawthorne	X	X	X	X
West Sacramento	X	X	X	

Source: Energy Commission staff analysis

The emissions reductions associated with the projects are anticipated to lead to improved air quality in these communities. While overall air quality depends on a number of factors, the Energy Commission expects that air quality will improve over time with the increased use of alternative fuels, in disadvantaged communities and those communities with the most significant exposure to air contaminants.

In summary, the proposed projects will reduce emissions, exposure, and health risk at a local level based on the assumption that the vehicles deployed and operated in concert with the projects are cleaner than the gasoline vehicles they will replace.

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12 For purposes of this analysis, staff used the following criteria: unemployment rate exceeds the state unemployment rate (12.4 percent), statewide percentage of persons below the poverty level (13.3 percent), a minority subset represents more than 30 percent of the city population, and population under 5 years or over 65 years is 20 percent higher than the State average (7.4 percent <5 years, and 11.2 percent >65 years).

**Table 4: Demographic Data for Hydrogen Fuel Infrastructure Plants (PON-09-608) Projects**

(Percentage of total population)

City	Beverly Hills**	Diamond Bar	Carson	Hawthorne	Hermosa Beach/Redondo Beach*	Irvine	Laguna Niguel	Millbrae/Burlingame*	Santa Monica	West Sacramento
<b>Below poverty level</b>	9.1	6.0	9.3	20.3	5.9	9.1	4.1	5.7	10.4	13.3
<b>Ethnicity</b>										
Black	1.8	4.8	25.4	33.0	2.5	1.4	1.3	1.1	3.8	6.6
American Indian or Alaskan Native	0.1	0.3	0.6	0.8	0.5	0.2	0.3	0.2	0.5	1.2
Asian or Pacific Islander	7.1	42.8	25.3	7.6	9.5	29.9	7.8	14.3	7.4	13.1
Hispanic	4.6	18.5	34.9	44.3	13.5	7.4	10.4	10.6	13.4	37.0
White	85.1	41.0	25.7	29.3	78.6	61.1	83.5	76.9	78.3	41.7
<b>Age</b>										
< 5 years	3.7	5.7	6.9	10.1	5.7	5.6	7.0	5.6	4.1	7.5
> 65 years	17.6	7.5	10.7	8.5	8.5	7.2	8.9	15.2	14.4	11.2
<b>Unemployment rate</b>	8.8	9.0	12.8	16.2	5.6	6.9	7.1	4.5	10.4	17.8

Source: Unemployment Information, EDD Labor Market Information Division; Age/ethnicity demographics, U.S. Census

\*Nearest city with data statistics

\*\* Beverly Hills demographic data is also applicable to the West Los Angeles Station